



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : C12N	A2	(11) International Publication Number: WO 99/53016 (43) International Publication Date: 21 October 1999 (21.10.99)
(21) International Application Number: PCT/US99/07902 (22) International Filing Date: 8 April 1999 (08.04.99) (30) Priority Data: 60/081,348 9 April 1998 (09.04.98) US Not furnished 7 April 1999 (07.04.99) US (71) Applicant (for all designated States except US): ARIZONA BOARD OF REGENTS, acting on behalf of ARIZONA STATE UNIVERSITY [US/US]; Tempe, AZ 85287 (US). (72) Inventor; and (75) Inventor/Applicant (for US only): WINICOV, Ilga [US/US]; 5452 North 78th Street, Scottsdale, AZ 85251 (US). (74) Agent: MYBECK, Richard, R.; Suite 10, 8010 East Morgan Trail, Scottsdale, AZ 85258 (US).		(81) Designated States: CA, JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published Without international search report and to be republished upon receipt of that report.
(54) Title: EXPRESSION OF <i>ALFIN1</i> AND METHODS FOR PRODUCING TRANSGENIC PLANTS HAVING INCREASED ROOT GROWTH AND ROOT SPECIFIC GENE ACTIVATION (57) Abstract <p><i>Alfin1</i> cDNA encodes a putative transcription factor associated with salt tolerance in alfalfa (<i>Medicago sativa</i> L.). The recombinant protein binds DNA in a sequence specific manner, including promoter fragments of the salt inducible gene <i>MsPRP2</i>. <i>Alfin1</i> function was tested in transgenic alfalfa under the control of the 35S promoter in the sense and antisense orientations with the endogenous <i>MsPRP2</i> as a reporter gene. Calli overexpressing <i>Alfin1</i> were more resistant to growth inhibition by 171 mM NaCl than vector transformed controls, while calli expressing <i>Alfin1</i> antisense were more sensitive to salt inhibition. Transgenic plants overexpressing <i>Alfin1</i> in the sense orientation grew well. In contrast, the antisense transgenic plants grew poorly in soil, demonstrating that <i>Alfin1</i> expression is essential for normal plant development. Transgenic calli and plant roots overexpressing <i>Alfin1</i> showed enhanced levels of endogenous <i>MsPRP2</i> mRNA accumulation. However, <i>MsPRP2</i> mRNA accumulation was also regulated in a tissue specific manner as shown in leaves of transgenics overexpressing <i>Alfin1</i>. These results suggest that <i>Alfin1</i> acts as a transcriptional regulator in plants and <i>MsPRP2</i> expression in alfalfa. <i>Alfin1</i> overexpressing transgenics showed salinity tolerance comparable to one of our salt-tolerant plants, indicating that <i>Alfin1</i> also functions in gene regulation in salt tolerance.</p>		

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